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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,969	09/18/2003	Chia-Shing Chou	WMI001	8333
7590	03/22/2005		EXAMINER	
Chia Chou 517 Hastings Court Oak Park, CA 91377				ROJAS, BERNARD
			ART UNIT	PAPER NUMBER
				2832

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/665,969	CHOU, CHIA-SHING
	Examiner	Art Unit
	Bernard Rojas	2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 18 June 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-37 is/are pending in the application.  
 4a) Of the above claim(s) 31-37 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-30 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I claims 1-30 in the reply filed on 06/18/2004 is acknowledged. Upon search of the invention, Examiner now withdraws the election of species requirement.

### ***Claim Objections***

Claims 7 and 22 are objected to because of the following informalities: Claim 7 is an exact duplicate of claim 5 and claim 22 is an exact duplicate of claim 20. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 10, 13, 14 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun [US 6,307,452].

Claim 1, Sun discloses a micro-electro-mechanical system (MEMS) switch [10] comprising:

an actuating portion [20] attached with a substrate [12];  
an actuating portion contact [34] disposed on the actuating portion, the actuating portion contact being located between the actuating portion and the substrate [figure 5a]; and

a substrate contact [18] on top of the substrate, the substrate contact including a metal platform portion [32] extending a height therefrom toward the actuating portion contact, wherein the actuating portion contact and the substrate contact are aligned to contact when the actuating portion is moved from a first position to a second position,

wherein an area of the metal platform portion is independently selectable of an area of the actuating portion contact [figures 5a, 5b].

Claim 2, Sun discloses that the metal platform portion is comprised of at least one metal selected from a group consisting of: gold, platinum [col. 4 lines 43-45].

Claims 3 and 13, Sun discloses the switch of claim 2, wherein the substrate is comprised of at least one material selected from a group consisting of: gallium arsenide [col. 2 line 54-58].

Claims 4 and 14, Sun et al. a switch of claim 3, wherein the actuating portion is a cantilever structure, the cantilever structure having a first region and a second region, the first region of the cantilever structure being attached with the substrate [at 24].

Claim 10 25, Sun et al. discloses a switch of claim 4, wherein the second region of the cantilever structure is attached with the substrate [figures 5a-5b].

Claims 1-4, 13 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Bechtle et al. [US 6,535,091].

Claim 1, Bechtle et al. discloses a micro-electro-mechanical system (MEMS) switch [100] comprising:

an actuating portion [120, 122] attached with a substrate [128];

an actuating portion contact [130] disposed on the actuating portion, the actuating portion contact being located between the actuating portion and the substrate [figure 2a]; and

a substrate contact [104] on top of the substrate, the substrate contact including a metal platform portion [105] extending a height therefrom toward the actuating portion contact, wherein the actuating portion contact and the substrate contact are aligned to contact when the actuating portion is moved from a first position to a second position,

wherein an area of the metal platform portion is independently selectable of an area of the actuating portion contact [figures 1 and 2a].

Claim 2, Bechtle et al. discloses that the metal platform portion is comprised of at least one metal selected from a group consisting of: gold [col. 7 lines 29-50].

Claims 3 and 13, Bechtle et al. discloses the switch of claim 2, wherein the substrate is comprised of at least one material selected from a group consisting of: gallium arsenide [col. 3 line 15-20].

Claims 4 and 14, Bechtle et al. a switch of claim 3, wherein the actuating portion is a cantilever structure [figure 1], the cantilever structure having a first region and a

second region, the first region of the cantilever structure being attached with the substrate [at 136].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 10-24 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over HSU et al. [US 6,768,403] in view of Sun [US 6,307,452].

Claim 1, Hsu et al. discloses a micro-electro-mechanical system (MEMS) switch [figure 2a] comprising:

an actuating portion [16] attached with a substrate [14];

an actuating portion contact [24] disposed on the actuating portion, the actuating portion contact being located between the actuating portion and the substrate [figure 5a]; and

a substrate contact [18, 20] on top of the substrate, wherein the actuating portion contact and the substrate contact are aligned to contact when the actuating portion is moved from a first position to a second position.

Hsu et al. fails to teach the use of a metal platform formed on the substrate contact.

Sun discloses a micro-electro-mechanical system (MEMS) switch [10] comprising an actuating portion [20] attached with a substrate contact [18] on top of the substrate, the substrate contact including a metal platform portion [32] extending a height therefrom toward the actuating portion contact, wherein the actuating portion contact and the substrate contact are aligned to contact when the actuating portion is moved from a first position to a second position, wherein an area of the metal platform portion is independently selectable of an area of the actuating portion contact [figures 5a, 5b].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a substrate contact with a metal platform portion [32] extending a height therefrom toward the actuating portion contact to the Mem switch of Hsu in order to reduce the height between the substrate contact and the actuation contact thereby increasing the actuation response time and creating a larger gap between the armature and the actuation electrode in order to prevent a short circuit.

Claim 2, Sun discloses that the metal platform portion is comprised of at least one metal selected from a group consisting of: gold, platinum [col. 4 lines 43-45].

Claims 3 and 13, Hsu et al. discloses that the substrate is comprised of gallium arsenide [col. 6 line 64-65].

Claim 4 and 14, Hsu et al. discloses that the actuating portion is a cantilever structure [figure 2a], the cantilever structure having a first region and a second region, the first region of the cantilever structure being attached with the substrate [32].

Claims 5 and 7, Hsu et al. discloses the switch further comprising a first RF transmission line [18] and a second RF transmission line [20] formed on the substrate

[col. 4 lines 19-25], wherein the actuating portion contact is formed as a contact transmission line having a first contact region and a second contact region, with the first contact region aligned with the at least a portion of the first RF transmission line, and the second contact region aligned with at least a portion of the second RF transmission line, whereby when the cantilever is moved from the first position to the second position, the contact transmission line forms an electrical path between the first and second RF transmission lines [figures 2a and 2b, col. 5 lines 55-60].

Claim 6, Hsu et al. discloses a switch of claim 5 further comprising:

a substrate bias electrode [22] disposed on the substrate; and  
a cantilever bias electrode [30] included with the cantilever, the substrate bias electrode and the cantilever bias electrode forming a bias electrode pair such that the bias electrode pair may be actuated to urge the cantilever bias electrode toward substrate bias electrode moving the cantilever structure from the first position [figure 2a] to the second position [figure 2b].

Claim 8, Hsu et al. discloses a switch of claim 4, wherein the cantilever structure has into two sections a DC cantilever section [30] and a RF cantilever section [18], the DC cantilever section being attached with the substrate at a first portion [32] and the RF cantilever section being attached with the substrate at a first portion, the switch further comprising:

a first RF transmission line [18, 20] disposed on the substrate, the first RF transmission line including the substrate contact; and

a second RF transmission line [24], the second RF transmission line being included with the RF cantilever section, the second RF transmission line including the actuation portion contact,

whereby when the cantilever is moved from the first position to the second position the actuating portion contact contacts the substrate contact creating an electrical path between the first and second RF transmission lines [figure 2b, col. 5 lines 55-60].

Claim 9, Hsu et al. discloses a switch of claim 8 further comprising:  
a substrate bias electrode [22] disposed on the substrate; and  
a DC cantilever bias electrode [30] included with the DC cantilever section, the substrate bias electrode and the DC cantilever bias electrode forming a bias electrode pair such that the bias electrode pair may be actuated to urge the DC cantilever bias electrode toward the substrate bias electrode [col. 5 lines 55-60] moving the cantilever structure from the first position [figure 2a] to the second position [figure 2b].

Claim 11, Hsu et al. discloses a switch of claim 10 further comprising:  
a first RF transmission line included with the cantilever structure, wherein the first RF transmission line includes the actuating portion contact [24];  
a second RF transmission line disposed on the substrate, the second RF transmission line including the substrate contact [18, 20], whereby when the cantilever is moved from the first position to the second position the actuating portion contact contacts the substrate contact [figure 5b].

Claims 12 and 15, Hsu et al. discloses a switch of claim 11 further comprising:

a substrate bias electrode [22] disposed on the substrate; and  
a cantilever bias electrode [30] included with the cantilever structure, the substrate bias electrode and the cantilever bias electrode forming a bias electrode pair such that the bias electrode pair may be actuated to urge the cantilever bias electrode toward the substrate bias electrode [col. 5 lines 55-60] moving the cantilever structure from the first position [figure 2a] to the second position [figure 2b].

Claim 16, Hsu et al. discloses a micro-electro-mechanical system (MEMS) switch [figure 2a] comprising:

means for supporting [14];  
a movable portion [16] having a first part and a second part, one part of the movable portion [32] fixed with the means for supporting  
a first means for conducting energy [24] located on the movable portion between the movable portion and the means for supporting.  
a second means for conducting energy [18, 20] located on the means for supporting, wherein the first and second means for conducting energy are aligned to contact when the movable portion is moved from a first position [figure 2a] to a second position [figure 2b],

Hsu et al. fails to teach the use of a metal platform formed on the second means for conducting energy

Sun discloses a micro-electro-mechanical system (MEMS) switch [10] comprising an actuating portion [20] attached with a substrate contact [18] on top of the substrate, the substrate contact including a metal platform portion [32] extending a height

therefrom toward the actuating portion contact, wherein the actuating portion contact and the substrate contact are aligned to contact when the actuating portion is moved from a first position to a second position, wherein an area of the metal platform portion is independently selectable of an area of the actuating portion contact [figures 5a, 5b].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a substrate contact with a metal platform portion [32] extending a height therefrom toward the actuating portion contact to the Mem switch of Hsu in order to reduce the height between the substrate contact and the actuation contact thereby increasing the actuation response time and creating a larger gap between the armature and the actuation electrode in order to prevent a short circuit.

Claim 17, Sun discloses that the metal platform portion is comprised of at least one metal selected from a group consisting of: gold, platinum [col. 4 lines 43-45].

Claims 18 and 28, Hsu et al. discloses that the means for supporting is comprised of gallium arsenide [col. 6 line 64-65].

Claim 19 and 29, Hsu et al. discloses that the movable portion is a cantilever structure [figure 2a], the cantilever structure having a first region and a second region, the first region of the cantilever structure being attached with the supporting means [32].

Claims 20 and 22, Hsu et al. discloses the switch further comprising a first RF transmission [18] and a second RF transmission [20] means formed on the means for supporting [col. 4 lines 19-25], wherein the first means for conducting [24] is formed as third means for RF transmission having a first means for contact and a second means for contact [figures 1, 2a and 2b], with the first means for contact aligned with the at

least a portion of the first means for RF transmission, and the second means for contact aligned with at least a portion of the second means for RF transmission, whereby when the movable is moved from the first position [figure 2a] to the second position [figure 2b], the third means for RF transmission forms an electrical path between the first and second means for RF transmission [figures 2a and 2b, col. 5 lines 55-60].

Claim 21, Hsu et al. discloses a switch of claim 5 further comprising:  
a first means [22] for moving the movable portion; and  
a second means [30] for moving the movable portion, the first means for moving being attached with the means for supporting and the second means for moving being integrated with the movable portion, such that the first and second means for moving may be actuated to urge the first means for moving toward the second means for moving resulting in moving the movable portion from the first position [figure 2a] to the second position [figure 2b].

Claim 23, Hsu et al. discloses a switch of claim 4, wherein the cantilever structure has into two sections a DC cantilever section [30] and a RF cantilever section [18], the DC cantilever section being attached with the means for supporting at a first portion [32] and the RF cantilever section being attached with the means for supporting at a first portion, the switch further comprising:

a first means for RF transmission [18, 20] disposed on the means for supporting, the first means for RF transmission including the second means for conducting; and  
a second means for RF transmission [24], the second means for RF transmission being included with the RF cantilever structure,

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whereby when the cantilever is moved from the first position to the second position the first means for conducting contacts the second means for conducting creating an electrical path between the first and second means for RF transmission [figure 2b, col. 5 lines 55-60].

Claims 24, 27 and 30, Hsu et al. discloses means [22, 30] for moving the cantilever structure from a first position to a second position [col. 5 lines 55-60].

Claim 26, Hsu et al. discloses a switch of claim 10 further comprising:

a first means for RF transmission included with the cantilever structure, wherein the first means for RF transmission includes the first means for conducting [24];

a second means for RF transmission disposed on the means for supporting, wherein the second means for RF transmission includes the second means for conducting [18, 20], whereby when the cantilever is moved from the first position to the second position the first means for conducting contacts the second means for conducting [figure 5b].

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Bernard Ross*  
Br

*[Signature]*  
SPE-AU2832  
3/9/04